OCEAN GALES AND STORMS, FEBRUARY 1936—Continued

Vessel	Voyage		Position at time of lowest barometer		Gale began February—	Time of lowest barometer February—	Gale ended February—	Lowest barometer	Direction of wind when gale began	Direction and force of wind at time of lowest barometer	Direction of wind when gale ended	Direction and highest force of wind	Shifts of wind near time of lowest barometer
	From—	To—	Latitude	Longitude									
NORTH PACIFIC OCEAN—Continued			° ′	° ′				*Inches*					
Shelton, Am. S. S.	Tabaco	Los Angeles	33 30 N.	153 42 E.	25	5p, 25	26	29.62	W	W, 8	NW	NW, 9	WSW-W.
Golden Mountain, Am. S. S.	Tandoc	San Francisco	33 12 N.	152 41 E.	25	4p, 25	26	29.62	SW	NW, 7	N	NW, 9	None.
Empress of Asia, Br. S. S.	Victoria	Yokohama	52 06 N.	167 35 W.	26	4p, 26	27	28.98	ENE	ENE, 7	N	NE, 8	ENE-NE.
Shelton, Am. S. S.	Tabaco	Los Angeles	33 38 N.	159 40 E.	27	4p, 27	28	28.58	SE	SW, 12	NW	WSW, 12	SW-NW.
Golden Mountain, Am. S. S.	Tandoc	San Francisco	34 44 N.	160 36 E.	27	6p, 27	28	28.64	S	S, 10	NW	NW, 12	SE-S-NW.
Pennsylvania, Am. S. S.	Manila	do	36 36 N.	162 24 E.	27	do	28	29.27	ENE	ENE	N	NNE, 9	ENE-NNE.
Meigs, U. S. A. T.	do	do	36 52 N.	166 43 W.	27	Noon, 28	28	29.10	SSE	SSW, 8	WSW	SSW, 10	SSE-SSW.
SOUTH PACIFIC OCEAN													
Maunganui, Br. S. S.	Rarotonga	Wellington, N. Z.	40 24 S.	177 05 E.	2	4p, 2	3	28.73	N	WSW, 2	S	SSW, 12	N-WSW-SSW.

NORTH PACIFIC OCEAN, FEBRUARY 1936

By Willis E. Hurd

Atmospheric pressure.—The major average-pressure feature over the North Pacific Ocean in February 1936 was a great depression which dominated all the northern part of the ocean except extreme northeastern waters, and in middle longitudes extended well into the equatorial region. The lowest average pressure recorded for the month was 29.58 inches, at Dutch Harbor. This was practically normal for February. The center of the LOW, however, was somewhat to the southwestward. The extent of the depression is well indicated by the fact that at Midway Island and Honolulu the average barometers were 0.13 and 0.15 inch, respectively, below the normal for the month. At Honolulu the barometer fell to 29.34 inches on the 3d, which is, by almost two-tenths of an inch, the record low pressure for that station.

In extreme eastern waters of the Pacific, abnormal pressure conditions prevailed from the Alaskan Peninsula southeastward to southern California, as shown by the averages at Kokiak and Juneau, which were much above normal, and at Tatoosh Island and San Francisco, which were considerably below.

Over the southeastern and southwestern parts of the ocean, pressures were practically normal.

The high-pressure systems, on the average, this month were confined to the extreme northeastern Pacific and to the waters east of China.

TABLE 1.—*Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, February 1936, at selected stations*

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	Inches	*Inch*	*Inches*		*Inches*	
Point Barrow	30.54	+0.42	31.10	4	30.02	29
Dutch Harbor	29.58	−.02	30.28	1	28.90	15
St. Paul	29.68	+.03	30.32	1	29.04	15
Kodiak	29.85	+.23	30.38	1	28.76	29
Juneau	30.06	+.14	30.46	6	29.21	29
Tatoosh Island	29.88	−.12	30.47	29	29.10	21
San Francisco	29.98	−.12	30.45	26	29.53	12
Mazatlan	29.93	.00	30.04	9	29.84	3, 4
Honolulu	29.90	−.15	30.08	11	29.34	3
Midway Island	29.86	−.13	30.10	9, 10	29.52	22
Guam	29.92	+.01	30.02	12	29.84	21
Manila	29.89	.00	29.96	(1)	29.80	28
Hong Kong	29.97	------	30.28	11	29.67	25
Naha	30.01	−.04	30.26	12	29.68	25
Chichishima	29.96	−.02	30.18	3	29.76	20
Nemuro	29.86	------	30.24	7	29.44	18

[1] On seven dates.

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

Cyclones and gales.—The meteorological conditions observed over the North Pacific were of unusual interest. In higher latitudes, although the Aleutian disturbance was prevalent throughout March, the degree of storminess between 40° N. and the Aleutian Islands and Alaska was comparatively slight. Practically all the gales reported along the northern routes occurred between the meridians of 180° and 160° W. on the 24th to 27th, and were mostly of forces 8 to 9.

The region most affected by storminess was that of the middle latitudes, roughly between 25° and 40° N. Into the western part of this region moved the most intense cyclones of the month; the central part was invaded to unusually low latitudes by extensions of the fluctuating Aleutian cyclone; and the eastern area was the scene of the abnormal cyclonic activity which on the 3d caused the lowest pressure ever known over the eastern Hawaiian Islands.

This storm, which may be referred to as the Hawaiian cyclone, was centered to the northeast of the islands on the 1st, moving west, with a southward inclination. It was already of great depth for its location, and by the 2d had acquired considerable wind intensity, as indicated by the report of the American steamer *Diamond Head*, which experienced a gale of force 10 from the southeast. The ship's lowest barometer for the day was 29.13 inches, read near 28° N., 153° W. On the 3d the center was close to the north of Honolulu. Thereafter the storm moved first to the northeast and then to the northwest but from the 7th to 10th remained practically stationary about midway along the California to Hawaii routes. On the 11th it moved rapidly northeast and entered the Washington-Oregon coast on the 12th. Throughout its course it was of unusual depth for a cyclone in this region. Fresh local gales attended most of its course from the 1st to 12th, except on the 2d, when the heavier gale was reported.

An important cyclone of the month was that which lay as a depression over central Japan on February 3. This disturbance moved rapidly seaward, and had gathered great energy by the 4th, on which date the American steamer *President Garfield*, near 35° N., 145° E., experienced a south-southwest gale of hurricane force, barometer 29.30. On the 5th the Norwegian motorship *Corneville* and the British motorship *Chinese Prince* were heavily involved near 30°–32° N., 150° E., both reporting hurricane velocities. In a special report of the storm from the *Chinese Prince*, Capt. W. Finch, master, Leslie G. Taylor, third officer and observer, the violence of the storm was stressed, and it was stated that on the morning of the

5th the waves piling in with the westerly wind squalls were "estimated to have a height of 50 to 60 feet"; another point of interest was that "the most noticeable characteristic of the cyclone was the absence of rain; what rain squalls were experienced were short in duration—possibly lasting not more than 30 seconds."

On the 6th the cyclone expanded and lost energy as it moved into higher latitudes.

During the middle third of February the major part of the ocean was dominated by cyclonic conditions. The severest gale of this period was reported from the Danish motorship *Peter Maersk* on the 15th, near 35° N., 157° E., barometer 29.54. Gales of lesser force (8–10), but accompanied by lower pressures, occurred near midocean on the 12th to 14th. There were, however, fewer gales reported than might have been expected as a result of this long-continued disturbance.

On February 22 a LOW appeared south of Japan. At this time the highest wind force reported in connection with it was 8. With eastward advance of the cyclone, however, it gathered energy; and on the 24th, in 32°–33° N., 147°–148° E., the American steamers *Golden Mountain* and *Pennsylvania* were experiencing hurricane winds, lowest barometer on the *Pennsylvania*, 28.76. Close by these ships, the American steamer *Shelton* encountered winds of force 11 from west-northwest. This steamer, during the early part of her passage from Tabaco to Los Angeles, had much tempestuous weather, culminating in a further westerly gale, of force 12, on the 27th near 34° N., 160° E. Upon this occasion, while the seas were moderate, the air was so filled with flying spume that visibility was restricted to 50 feet. The barometer was oscillating so violently that accurate readings could not be obtained.

In connection with the heavily disturbed weather of the 24th to 27th in east longitudes, the U. S. A. T. *Meigs*, on the 25th, reported a wind of force 11, and the lowest pressure reading of the month, 28.43, both near 37° N., 171° E.

By February 29 the weather had moderated over all heretofore stormy parts of the ocean, with the center of the principal LOW lying over the Gulf of Alaska.

Tehuantepecers.—In the Gulf of Tehuantepec northers of force 7 occurred on the 1st and 22d.

Fog.—More fog was observed along the eastern half of the northern routes than during any previous month since September 1935, ships in some 5-degree squares south of the eastern Aleutians reporting it on 3 days. In the region 24°–45° N., 125°–140° W., it was reported on 10 days. For American coastal waters, there were 2 days with fog observations off Washington-Oregon; 8 days off California; 6 off lower California; and 2 south of Costa Rica.

Waterspout and static.—Observing Officer Taylor on the British motorship *Chinese Prince*, reported a waterspout in connection with a heavy line squall in 24°42′ N., 127°08′ E., on the 22d. According to the wireless operator on the ship, "previous to the waterspout atmospherics were very bad, but immediately after vessel had passed the phenomenon, radio reception was almost perfect."